इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 10118-1 (1982): Code of Practice for Selection, Installation and Maintenance of Switchgear and Control gear, Part I: General [ETD 20: Electrical Installation]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

IS : 10118 (Part I) - 1982

Indian Standard (Reaffirmed 2001)

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF SWITCHGEAR AND CONTROLGEAR

PART I GENERAL

(Second Reprint JULY 1990)

UDC 621.316.3/.7.004:006.76

© *Copyright* 1982

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *December* 1982

Indian Standard

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF SWITCHGEAR AND CONTROLGEAR

PART I GENERAL

Code of Practice for Power Installation and Maintenance Sectional Committee, ETDC 20

Chairman	*Representing*
SHRI K. K. BOSE	Calcutta Electric Supply Corporation Ltd, Calcutta
Members	
SHRI A. CHATTERJEE (*Alternate* to Shri K. K. Bose)	
SHRI B. C. ALVA	Karnataka Electricity Board, Bangalore
SHRI T. N. R. RAO (*Alternate*)	
SHRI M. J. ANANDAMURTHY	Chief Electrical Inspector to the Government of Tamil Nadu, Madras
ELECTRICAL INSPECTOR (TECHNICAL) TO THE GOVERNMENT OF TAMIL NADU (*Alternate*)	
SHRI P. D. BAGADE	Tata Consulting Engineers, Bombay
SHRI R. C. BAJPAI (*Alternate*)	
SHRI V. S. BHATIA	Siemens India Ltd, Bombay
SHRI K. K. PANT (*Alternate*)	
SHRI K. V. CHAUBAL	The Federation of Electricity Undertakings of India, Bombay
SHRI K. S. JOSHI (*Alternate*)	
CHIEF ELECTRICAL ENGINEER	Railway Board, Ministry of Railways
DEPUTY DIRECTOR STANDARDS (ELEC) – IV, RDSO (*Alternate*)	
CHIEF ENGINEER (ELEC)-I	Central Public Works Department, New Delhi
SURVEYOR OF WORKS (ELEC)-I (*Alternate*)	
SHRI B. L. DESHPANDE	Electrical Engineer to Government of Maharashtra, Bombay
SHRI DEVENDER NATH	Larsen & Toubro Ltd, Bombay
SHRI T. P. R. SARMA (*Alternate*)	
SHRI K. V. DHARMADHIKARI	Jyoti Ltd, Vadodara
SHRI D. J. HASTAK	Maharashtra State Electricity Boards, Bombay

(*Continued on page* 2)

© *Copyright* 1982
BUREAU OF INDIAN STANDARDS
This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
Member (Hydro-Electric)	Central Electricity Authority, New Delhi
Director (Hed)-I (*Alternate*)	
Shri D. R. Neelappa Reddy	NGEF Ltd, Bangalore
Shri G. S. N. Murthy (*Alternate*)	
Shri K. P. R. Pillai	Fact Engineering and Design Organization, Udyogamandal
Shri C. R. R. Menon (*Alternate*)	
Lt-Col B. B. Rajpal	Engineer-in-Chief's Branch, Army Headquarters (Ministry of Defence)
Shri S. K. Shangari (*Alternate*)	
Shri Ranes Ray Choudhuri	Engineering Construction Corporation Limited, Bombay
Shri L. E. D. Cruz (*Alternate*)	
Shri B. M. Samant	The Bombay Electric Supply and Transport Undertaking, Bombay
Shri S. R. Ugrankar (*Alternate*)	
Shri I. C. Sanger	Delhi Electric Supply Undertaking, New Delhi
Shri P. S. Sawhney (*Alternate*)	
Shri Sardul Singh	Chief Electrical Inspector to the Government of Punjab, Chandigarh
Sardar D. S. Uppal (*Alternate*)	
Shri V. Sathyanathan	Tamil Nadu Electricity Board, Madras
Shri S. Krishnaraj (*Alternate*)	
Shri R. Satyabal	Tariff Advisory Committee, General Insurance Association of India, Bombay
Shri K. K. Mandal (*Alternate*)	
Shri P. K. Saxena	Rural Electrification Corporation Ltd, New Delhi
Shri S. L. Dua (*Alternate*)	
Dr T. C. Sidhan	Chief Electrical Inspector to the Government of Kerala, Trivandrum
Shri K. S. Subrahmaniyam	Bharat Heavy Electricals Ltd, Secunderabad
Shri G. P. Pahwa (*Alternate*)	
Shri G. N. Thadani	Engineers India Ltd, New Delhi
Shri S. G. Gokhale (*Alternate*)	
Shri S. Vaidyanathan	Kerala State Electricity Boards, Trivandrum
Shri R. Varadarajan (*Alternate*)	
Shri S. P. Sachdev, Director (Elec tech)	Director General, ISI (*Ex-officio Member*)

Secretary

Shri K. Ganesh
Assistant Director (Elec tech), ISI

Panel for Selection, Installation and Maintenance Switchgear and Controlgear ETDC 20/P25

Shri O. P. Anand	Delhi Electric Supply Undertaking, New Delhi
Shri Jagmohan (*Alternate*)	

(*Continued on page* 11)

Indian Standard

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF SWITCHGEAR AND CONTROLGEAR

PART I GENERAL

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 26 February 1982, after the draft finalised by the Code of Practice for Power Installation and Maintenance Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 The object of this series of standards is to provide guidelines for the selection, installation and maintenance of switchgear and controlgear and associated equipment.

0.3 It has been generally felt that the requirements of switchgear of different voltage ratings can be conveniently covered in a single standard. Keeping this in view, the Indian Standard IS : 3072-1975* was brought out to cover equipments for indoor and outdoor use. Equipments so covered included circuit-breakers, isolators and other switches operating on ac or dc. Separate Indian Standards had been formulated as follows, for detailed Codes of Practices for fuses, ac induction motor starters, high voltage ac circuit-breakers and other switches:

IS : 3106-1966 Code of practice for selection, installation and maintenance of fuses (voltage not exceeding 650 volts),

IS : 3914-1967 Code of practice for selection of ac inductor motor starters (voltage not exceeding 1 000 volts),

IS : 5124-1969 Code of practice for installation and maintenance of ac induction motor starters (voltage not exceeding 1 000 V),

IS : 5987-1970 Code of practice for selection of switches (voltage not exceeding 1 000 V), and

IS : 7987-1976 Guide for selection of high voltage ac circuit-breakers.

---

*Code of practice for installation and maintenance of switchgear (*first revision*).

0.4 This Indian Standard is being brought out with a view to presenting in a cogent fashion, the Codes of Practice for various types of switchgear and controlgear used in electric power system, filling up the gaps between these specifications, utilising the latest in concepts introduced in the product specifications.

0.5 This standard presents the subject product-wise, bringing out the relevant good practices recommended for LT and HT applications separately. This standard is being brought out in four parts, namely:

Part I	General,
Part II	Selection,
Part III	Installation, and
Part IV	Maintenance.

All these parts shall be read in conjunction with each other.

0.6 In the preparation of this standard, considerable assistance has been derived from the information contained in the Indian Standards listed in **0.3**. On publication of this standard (Parts I to IV), the Indian Standards in **0.3** would stand withdrawn.

0.7 During the drafting of the various parts of this standard, the expert Panel, responsible for the same, had kept in view the fact that this standard could at best give guidance on the bulk of the equipment used in the country and should be understood in the manner; that aspects relating to selection, installation or maintenance of EHV equipment as well as those intended for very special application would have to be supplemented with additional data, not attempted by the present series.

0.8 For the purposes of ready reference, a list of product specifications covering switchgear and controlgear equipment are given in Appendix A. The Codes of practice, read together with the relevant Indian Standard specification on the equipment would provide the necessary guidelines.

0.9 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) covers the general aspects pertaining to the selection, installation and maintenance of all types of switchgear and controlgear for indoor and outdoor use.

---

*Rules for rounding off numerical values (*revised*).

1.2 For the purposes of this standard special types of equipments such as those intended for use in hazardous atmospheres are excluded. Provisions for the same are provided in separate Indian Standards.

1.3 Specific provisions relating to the practices for individual equipments, and equipments for individual applications in respect of selection and installation and maintenance form the scope of subsequent parts of this standard.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS:1885 (Part XVII)-1979* shall apply.

3. GENERAL PROVISIONS

3.1 Exchange of Information

3.1.1 Before ordering the plant, information should be exchanged between the owner, architect, engineer and equipment manufacturer responsible for its design, procurement, installation, operation and maintenance, so that the plant is procured to suit the duty, location and installation conditions under which the switchgear will operate. This information should include any special building features, such as access doors, lifting beams, oil pumps, cable trenches, foundation details, ventilating arrangement, weather conditions, etc, which may be desirable (*see* also Part II and III of this standard) as also the incorporation of any optional features in the switchgear.

3.1.2 Details of the electric supply available and of any special requirement regarding the rating of equipment which may be connected to the supply should be ascertained from the supply authority.

3.2 Transport Facilities

3.2.1 The engineer should obtain well in advance all relevant information about the overall dimensions, weight for transport, installation, etc, of the switchgear in question. Special precautions may be essential for the protection of insulation during shipment and prior to energizing to prevent moisture absorption due to rain, snow or condensation. These may include shipment of insulating parts in oil to prevent contamination. Appropriate instructions should be given in this regard. When the circuit-breaker is dismantled for transport, all parts should be clearly marked, drawings showing assembly of these parts and a packing list should be supplied to the user.

---

*Electrotechnical vocabulary: Part XVII Switchgear and controlgear (*first revision*).

3.3 Drawings, Materials and Appliances

3.3.1 The manufacturer should provide drawings and instructions for the installation and maintenance of switchgear well in advance of the time of delivery. It is essential that the installation of switchgear as well as its maintenance in service is performed in accordance with the provisions of the relevant Indian Standard or the instructions given by the manufacturer.

3.3.2 All materials, fittings, apparatus, etc, used in the installation shall conform to relevant Indian Standard specifications wherever they exist, and in the case where they do not exist, the items shall be approved by competent authority.

4. SAFETY AND STATUTORY REGULATIONS

4.1 Compliance with Indian Electricity Rules and Other Regulations

4.1.1 All electrical installations shall comply with the requirements of the Indian Electricity Act and Rules made thereunder and with other regulation. Such as those made under Factory Act, 1948 and Fire Insurance Act, that may be applicable. The following rules of Indian Electricity Rules 1956 are particularly applicable:

No. 29, 33, 34, 35, 36, 50, 51, 61, 62, 63, 64, 65, 67, 69 and 114.

4.1.2 If considered necessary the local authorities concerned in the administration of the rules and regulations in the matter of the layout of the installation of the switchgear should be consulted in regard to the rules and regulations that may be applicable.

4.1.3 The electrical installation shall be carried out only by authorized persons competent to undertake such work under the rules and regulations that may be in force in different States.

4.2 Earthing

4.2.1 It is absolutely essential that the entire earthing system should be designed with regard to the maximum available earth-fault current. This should be particularly checked whenever any plan extensions resulting in higher fault levels are made to ensure that the existing connections are suitable for the increased earth-fault current.

4.2.2 For additional details regarding earthing and size of earth bus and conductor, reference shall be made to IS : 3043-1966*.

---

*Code of practice for earthing.

4.3 Isolation — It is desirable to provide means for isolation of individual circuit or equipment of switchgear so that maintenance work can be undertaken on such circuits or equipment in complete safety, without the necessity of shutting down the whole switchboard.

4.4 Lightning Protection — Where considered appropriate, the necessary precautions shall be taken to ensure that the installation of switchgear and controlgear shall be protected from lightning surges. General guidelines are available in IS : 2309-1969*.

4.5 Oil Drainage — For indoor switchgear, an oil soak pit shall be provided where a single chamber of indoor switchgear has an oil capacity of more than 2 000 litres. For outdoor switchgear, suitable arrangement for drainage of oil shall be made.

5. CATEGORIZATION OF EQUIPMENT

5.1 It is an accepted practice to broadly classify switchgear and controlgear equipment based on rated voltage. Low voltage switchgear and controlgear are those intended for rated voltage up to and including 1 000 V ac or 1 200 V dc, and high voltage switchgear and controlgear are those intended for voltages above 1 000 V ac.

Individual equipment are further classified depending on the method of operation or on the type of construction. Product classifications are covered in Part II of this standard.

APPENDIX A

(*Clause* 0.8)

INDIAN STANDARDS ON SWITCHGEAR AND CONTROLGEAR

A-1. LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR

IS:

375-1963 Marking and arrangements for switchgear busbars, main connections and auxiliary wiring (*revised*)

1356 (Part I)-1972 Electrical equipment of machine tools: Part I Electrical equipment of machines for general use (*second revision*)

1885 (Part XVII)-1969 Electrotechnical vocabulary: Part XVII Switchgear and controlgear

---

*Code of practice for the protection of buildings and allied structures against lightning (*first revision*).

2032 (Part VI)-1965	Graphical symbols used in electrotechnology: Part VI Motor starters
2032 (Part VII)-1974	Graphical symbols used in electrotechnology: Part VII Switchgear and auxiliaries (*first revision*)
2086-1963	Carriers and bases used in rewirable type electric fuses up to 650 volts (*revised*)
2147-1962	Degrees of protection, provided by enclosures for low voltage switchgear and controlgear
2675-1966	Enclosed distribution fuse boards and cutouts for voltages not exceeding 1 000 volts (*first revision*)
2959-1975	Contractors for voltages not exceeding 1 000 V ac or 1 200 V dc (*first revision*)
4064 (Part I)-1978	Air-break switches, air-break disconnectors, air-break switch-disconnectors and fuse-combination units for voltages not exceeding 1 000 V ac or 1 200 V dc: Part I General requirements (*first revision*)
4064 (Part II)-1978	Air-break switches, air-break disconnectors, air-break switch-disconnectors and fuse-combination units for voltages not exceeding 1 000 V ac or 1 200 V dc: Part II Specific requirements for the direct switching of individual motors (*first revision*)
4237-1967	General requirements for switchgear and controlgear for voltages not exceeding 1 000 volts
5039-1969	Distribution pillars for voltages not exceeding 1 000 volts
5833-1970	Flameproof air-break electrically operated gate and boxes
6875 (Part I)-1973	Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages up to and including 1 000 V ac and 1 200 V dc: Part I General requirements
6875 (Part II)-1973	Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages up to and including 1 000 V ac and 1 200 V dc: Part II Push-buttons and related control switches
6875 (Part III)-1980	Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages up to and including 1 000 V ac and 1 200 V dc: Part III Rotary control switches
7118-1973	Recommendations for direction of movement for control devices operating electrical apparatus
8187-1976	D-type fuses
8200-1976	Toggle switches used in traction application

8544 (Part I)-1977 Motor starters for voltages not exceeding 1 000 V: Part I Direct-on-line ac starters

8544 (Part II)-1977 Motor starters for voltages not exceeding 1 000 V Part II Star-delta starters

8544 (Part III/Sec 1)-1979 Motor starters for voltages not exceeding 1 000 V: Part III Rheostatic rotor starters, Section 1 General requirements

8544 (Part III/Sec 2)-1979 Motor starters for voltages not exceeding 1 000 V: Part III Rheostatic rotor starters, Section 2 Additional requirements for ac rheostatic rotor controllers

8544 (Part IV)-1979 Motor starters for voltages not exceeding 1 000 V: Part IV Reduced voltage ac starters: Two-step auto-transformer starters

8588 (Part I)-1977 Thermostatic bimetals: Part I General requirements and methods of tests

8623 (Part I)-1977 Factory-built assemblies of switchgear and controlgear for voltages up to and including 1 000 V ac and 1 200 V dc: Part I General requirements

8623 (Part II)-1980 Factory-built assemblies of switchgear and controlgear for voltages up to and including 1 000 V ac and 1 200 V dc: Part II Particular requirements for busbar trunking systems (busways)

8724-1978 Dimensions for rewirable fuses up to 650 V

8828-1978 Miniature air-break circuit-breakers for voltages not exceeding 1 000 V

9224 (Part I)-1979 Low voltage fuses: Part I General requirements

9224 (Part II)-1979 Low voltage fuses: Part II Supplementary requirements for fuses with high breaking capacity for industrial application

9224 (Part IV)-1980 Low voltage fuses: Part IV Supplementary requirements for fuse-links for the protection of semiconductor devices

A-2. HIGH VOLTAGE SWITCHGEAR AND CONTROLGEAR

375-1963 Marking and arrangements for switchgear busbars, main connections and auxiliary wiring (*revised*)

1818-1972 Alternating current isolators (disconnectors) and earthing switches (*first revision*)

1885 (Part XVII)-1979 Electrotechnical vocabulary: Part XVII Switchgear and controlgear

2032 (Part VII)-1974 Graphical symbols used in electrotechnology: Part VII Switchgear and auxiliaries (*first revision*)

2516 (Part I/Sec 2)-1980 Circuit breakers: Part I General and definitions, Section 2 For voltages above 1 000 V ac

2516 (Part II/Sec 2)-1980 Circuit-breakers: Part II Rating, Section 2 For voltages above 1 000 V ac (*first revision*)

2516 (Part III/Sec 2)-1980 Circuit-breakers: Part III Design and construction, Section 2 For voltages above 1 000 V ac (*first revision*)

2516 (Part IV/Sec 2)-1980 Circuit breakers: Part IV Type tests and routine tests, Section 2 For voltage above 1 000 V ac

2516 (Part V/Sec 2)-1980 Circuit-breakers: Part V Information to be given with enquiries, tenders and orders and rules for transport, erection and maintenance, Section 2 For voltages above 1 000 V ac (*first revision*)

3427-1969 Metal-enclosed switchgear and controlgear for voltages above 1 000 V but not exceeding 11 000 volts

4710-1968 Switches and switch isolators above 1 000 V but not exceeding 11 000 V

5561-1970 Electric power connectors

7567-1975 Automatic reclosing circuit-breakers (automatic circuit reclosers) for ac distribution system

8084-1976 Interconnecting busbars for ac voltage above 1 kV up to and including 36 kV

9046-1978 Specification for ac contactors for voltages above 1 000 V up to and including 11 000 V

9135-1979 Guide for the testing of circuit-breakers with respect to out-of-phase switching

9385 (Part I)-1979 High voltage fuses: Part I Current-limiting fuses

9385 (Part II)-1980 High voltage fuses: Part II Expulsion and similar fuses

9385 (Part III)-1980 High voltage fuses: Part III Application guide for high voltage fuses

9402-1980 High voltage fuses for the external protection of shunt power capacitor

9920 (Part I)-1981 Alternating current switches for voltages above 1 000 V: Part I General and definitions

ontinued from page 2)

Members	*Representing*
Shri C. R. Balasubramanian	The English Electric Company of India Ltd, Madras
Shri M. Seshadri* (*Alternate*)	
Shri Devender Nath	Larsen & Toubro Limited, Bombay
Shri P. D. Jahagirdar	Maharashtra State Electricity Board, Bombay
Shri Javeed Ahmed	NGEF Ltd, Bangalore
Shri I. Narayana Rao (*Alternate*)	
Shri K. P. Sarathy (*Alternate*)	
Dr T. C. Sidhan	Chief Electrical Inspector to the Government of Kerala, Trivandrum
Prof. G. Ravindran Nair (*Alternate*)	
Shri Syed Khader Mohuddin	Karnataka Electricity Board, Bangalore
Shri R. Subba Rao	Bharat Heavy Electricals Ltd, Secunderabad
Shri P. S. Das (*Alternate*)	
Shri K. C. Lahari (*Alternate*)	
Shri G. N. Thadani	Engineers India Ltd, New Delhi
Shri M. K. Das (*Alternate*)	
Shri A. S. Udhalikar	Hindustan Brown Boveri Ltd, Bombay
Shri S. R. Potnis (*Alternate*)	

---

*Shri M. Seshadri, chaired the panel meetings.

INDIAN STANDARDS

ON

CODE OF PRACTICE FOR POWER INSTALLATION AND MAINTENAN

IS:

732-1963	Code of practice for electrical wiring installations (system voltage not exceeding 650 volts) (*revised*)
900-1965	Code of practice for installation and maintenance of induction motors (*revised*)
1866-1978	Code of practice for maintenance and supervision of insulating oil in service (*first revision*)
1885 (Part XXX)-1971	Electrotechnical vocabulary: Part XXX Overhead transmission and distribution of electrical energy
1885 (Part XXXVII)-1974	Electrotechnical vocabulary: Part XXXVII Tariffs for electricity
1886-1967	Code of practice for installation and maintenance of transformers (*first revision*)
2032 (Part XI)-1970	Graphical symbols used in electrotechnology: Part XI Electrical installations in buildings
2274-1963	Code of practice for electrical wiring installations (system voltage exceeding 650 volts)
2309-1969	Code of practice for the protection of buildings and allied structures against lighting (*first revision*)
2551-1963	Danger notice plates
3043-1966	Code of practice for earthing
3072-1975	Code of practice for installation and maintenance of switchgear (*first revision*)
3106-1966	Code of practice for selection, installation and maintenance of fuses (voltage not exceeding 650 volts)
3914-1967	Code of practice for selection of ac induction motor starters (voltage not exceeding 1 000 volts)
4648-1968	Guide for electrical layout in residential buildings
5124-1969	Code of practice for installation and maintenance of ac induction motor starters (voltage not exceedings 1 000 volts)
5216-1969	Guide for safety procedures and practices in electrical work
5578-1970	Guide for marking of insulated conductors
5613 (Part I/Sec 1)-1970	Code of practice for design, installation and maintenance of overhead power lines: Part I Lines upto and including 11 kV, Section 1 Design
5613 (Part I/Sec 2)-1971	Code of practice for design, installation and maintenance of overhead power lines: Part I Lines up to and including 11 kV, Section 2, Installation and maintenance
5613 (Part II/Sec 1)-1976	Code of practice for design, installation and maintenance of overhead power lines: Part II Lines above 11 kV and up to and including 220 kV, Section 1 Design
5613 (Part II/Sec 2)-1976	Code of practice for design, installation and maintenance of overhead power lines: Part II Lines above 11 kV and up to and including 220 kV, Section 2 Installation and maintenance
5728-1970	Guide for short-circuit calculations
5908-1970	Method of measurement of electrical installation in buildings
5987-1970	Code of practice for selection of switches (voltage not exceeding 1 000 V)
7689-1974	Guide for the control of undesirable static electricity
7733-1975	Code of practice for electrical wiring installation in hospitals
7752 (Part I)-1975	Guide for improvement of power factor in consumer installation: Part I Low and medium supply voltages
7987-1976	Guide for selection of high voltage circuit-breakers
8061-1976	Code of practice for design, installation and maintenance of service lines up to and including 650 V
8437-1977	Guide on effects of currents passing through human body
8884-1978	Code of practice for the installation of electric bells and call system
8923-1978	Warning symbol for dangerous voltages
8969-1978	Code of practice for installation and maintenance of impulse and electronic master and slave electric clock systems
9511-1980	Earth knobs for neutral conductors.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 331 01 31, 331 13 75

Telegrams: Manaksanstha
(Common to all Offices)

Regional Offices:	*Telephone*
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	331 01 31 331 13 75
*Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	41 24 42 41 25 19 41 29 16
†Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95

Branch Offices:	
'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48 2 63 49
‡Peenya Industrial Area 1st Stage, Bangalore Tumkur Road BANGALORE 560058	38 49 55 38 49 56
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 67 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No. 29, R.G. Barua Road, 5th Byelane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71 6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
T.C. No. 14/1421, University P.O., Palayam TRIVANDRUM 695035	6 21 04 6 21 17

Inspection Offices (With Sale Point):	
Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	2 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

---

*Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 — 27 68 00

†Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 — 89 65 28

‡Sales Office in Bangalore is at Unity Building, Narasimharaja Square, Bangalore 560002 — 22 36 71

Reprography Unit, BIS, New Delhi, India